Let Go of the Lugol: A Case of Lugol's Iodine Induced Hyperthyroidism

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INTRODUCTION

Thyrotoxicosis refers to the state of excessive amounts of thyroid hormone. It remains one of the most common thyroid disease states, with Grave's disease as the most common etiology. However, more recently exogenous use of thyroid hormones and iodine supplements seems to be on a rise which leads to thyrotoxicosis as well.

CASE REPORT

44-year-old male with no significant past medical history presented with palpitations associated with diarrhea, anxiety, restlessness, weight loss of 20 lbs and heat intolerance for several weeks. Physical examination showed tremors, brisk reflexes, no orbitopathy, thyromegaly.

Initial lab workup was consistent with hyperthyroidism as shown in table 1. Thyroid stimulating immunoglobulin testing for Grave's disease was negative. Thyroid ultrasound showed a diffusely enlarged thyroid with multiple bilateral subcentimeter nodules and radioiodine uptake study. (Fig 1)

Through history at the time of consultation with endocrinology revealed that the patient used Lugol's iodine as recommended by a holistic family practitioner. Reasoning for starting the solution is unknown, however the patient stated he had taken "a few drops" of the solution each morning for several years. Diagnosis was hyperthyroidism secondary to exogenous use of iodine supplements. Thyroiditis was ultimately ruled out due to lack of preceding viral infection and his clinical course.

He was offered beta blockade for symptomatic treatment as well as low dose antithyroid medication but patient insisted on clinical and lab surveillance instead. As expected, his levels improved over-time after discontinuation of iodine supplements (Table 1).

Table 1: LABS WITH CLINICAL OBSERVATION

Date	TSH (0.40-4.50 µIU/ml)	Free T4 (0.8-1.8 ng/dl)	Total T3 (2.3 – 4.2 pg/dL)	Medical Therapy
5/3/2019	<0.01	5.20	-	Stopped Lugol's iodine
6/102019	0.01	7.8	-	
7/1/2019		5.6	17.1	
8/13/2019		1.9	6.1	
9/13/2019		0.8	2.1	
11/11/2019		1.1	2.9	
3/6/2020		1.3	3.0	

FIGURE 1 : THYROID NUCLEAR UPTAKE AND SCAN

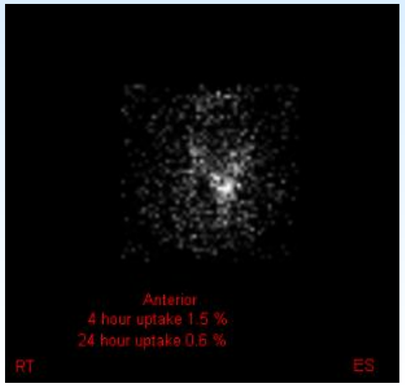

Fig 1: (Date 6/4/2019). After oral ingestion of 273 uCi I-123 NaII, showing minimal heterogenous activity of the gland. (Radionuclide uptake 0.6 ((normal range 15-35%)) at 24 hours).

DISCUSSION

Hyperthyroidism due to iodine-induced thyrotoxicosis, also known as the Jod-Basedow Effect, is less common and typically associated with elderly patients, patients with underlying thyroid gland dysfunction, renal disease, or residence in iodine-deficient areas who then receive intravenous iodinated contrast media. Increased amounts of circulating iodine leads to the Wolff-Chaikoff effect, an autoregulatory process in which there is temporary decreased synthesis of thyroid hormone. It acts as a protective measure against fluctuations in iodine intake, however an "escape" will occur and the thyroid will use the increased iodine to synthesize more thyroid hormone.

Lugol's iodine solution, a mixture of elemental (5%), and potassium iodine (10%) with distilled water, is available pre-made from online retail websites. Indicated uses include preoperative administration to prevent blood loss in thyroid surgery, postoperative to prevent thyroid storm following thyroid surgery, and to decrease risk of thyroid cancer by blocking thyroidal uptake of radioactive isotopes. It has also been marketed as a "thyroid supplement" by holistic practitioners and is able to be purchased without prescription .

This case illustrates the importance of including exogenous iodine consumption as part of the differential for a new hyperthyroidism diagnosis.

REFERENCES

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